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HEIGHT ADJUSTMENT DEVICE FOR THE UPPER ANCHORING OR DEFLECTION POINT FOR THE SHOULDER BELT OF A BELT SYSTEM

[Vorrichtung zur Höhenverstellung des oberen Verankerungs- bzw. Umlenkpunktes für den Schultergurt eines Gurtsystemes]

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Claims /1*

1. Height adjustment device for the upper anchoring or deflection point for the shoulder belt of a belt system in a vehicle, particularly, a motor vehicle, with individual seats that can be adjusted in horizontal and/or vertical direction, characterized in that a transmitting device (6) is interposed between each seat (3) and the assigned anchoring or deflection point (4) which displaces the anchoring point or deflection point (4) during a seat adjustment (3) in such a way that a height position of the anchoring or deflection point (4) is realized that, respectively, is adjusted in relation to the seat position that is favorable for the user of the belt system.

2. Device in accordance with Claim 1, characterized in that the transmitting device (6), at least, is visible in an original position, and the displacement of the anchoring or deflection point (4) occurs in steps or continuously, and that its displacement path is in a specific relation to that of the seat (3).

3. Device in accordance with any of the Claims 1 and 2, characterized in that the transmitting device (6) is comprised of an electrical transmitter, e.g., in the form of a potentiometer and a pilot motor.

4. Device in accordance with any of the Claims 1 and 2, characterized in that the transmitting device (6) exhibits a transmitter (7) in the form of, e.g., a hydraulic cylinder (8), on the side of the

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*Number in the margin indicates pagination in the foreign text.

seat, which acts upon a receiving cylinder (10) that is connected with the anchoring or deflection point (4).

5. Device in accordance with Claims 1 and 2, characterized in /2
that the transmitting device (6) is configured as a flexible train which transmits both traction and pressure forces.

6. Device in accordance with one or several of the previous Claims, characterized in that a two-arm lever (13) is carried on the longitudinally adjustable part of the seat (3), the one lever arm (14) of which exhibits a control rod (15) and the other lever arm (18) of which takes up one end of the transmitting device (6).

7. Device in accordance with one or several of the previous Claims, characterized in that a selector unit (19) is provided in which, starting out from a central position, a change of the height of the anchoring point or deflection point (4) can be realized without a simultaneous adjustment of the seat (3).

The invention relates to a height adjustment device of the upper /3
anchoring or deflection point for the shoulder belt of a belt system in a vehicle, particularly, a motor vehicle, with individual seats that can be adjusted in the horizontal and/or vertical direction.

Due to the difference in the sizes and proportions of belt users, it is extremely difficult to find a favorable position of the upper anchoring point for static belts or the deflection point for the shoulder belt of automatic belts for a large group of people. This is the reason why an early approach consisted of providing, at least, two superimposed attachment sites. This, however, is only partially remedial because it

is too cumbersome for the majority of belt users to adjust the attachment height for an only short-term use of the belt with the assistance of tools. Thus, as a rule, the height set during the operation time of the vehicle remains the same. This lack of adaptability is a contributory reason why, in many cases, the use of such a belt is rejected.

To find remedies here, it has been proposed, on the one hand, to /4 arrange the anchoring or deflection point so that it is displaceable in height, by means of a locking mechanism. A change in height can thereby be realized without any tools; but, many times, handling for non-experts is so complicated that an adjustment is just not made.

The option of changing the height of the anchoring or deflection point at one's discretion also poses an inherent danger that has not been fully recognized so far. Thus, it may easily happen that the belt user selects a height adjustment that gives him a positive feeling when he wears the belt, which, however, objectively, does not optimally protect the passenger in the event of a crash.

It is the objective of the invention to show the way to, largely, automatically adapt the position of the anchoring or deflection point under the aspect of convenience and the best protective effect to the largest possible group of people.

That is why a height adjustment device of the above anchoring or deflection point for the shoulder belt of a belt system in a vehicle, particularly, a motor vehicle, with horizontally and/or vertically adjustable individual seats is being proposed; whereas, in accordance

with the invention, a transmitting device is interposed between each seat and the assigned anchoring or deflection point that, when the seat is adjusted, displaces the anchoring point or deflection point in such /5 a way that a height position of the anchoring or deflection point is achieved relative to the respectively adjusted seat position that is favorable for the belt user.

In a preferred configuration example of the invention, the transmitting device can, at least, be standardized in an original position, and the displacement of the anchoring or deflection point occurs in steps or continuously, whereas its displacement path is in a specific ratio with the seat. Because the option exists to check the facility in accordance with the invention out in a specific position, the assembly process can be substantially simplified, as well. Whether a stepwise or continuous adjustment was selected, depends upon how the seat adjustment works. Thus, as a rule, if the seat is adjusted, a continuous displacement of the anchoring or deflection point by means of some auxiliary force will be the objective. The adjustment paths from the seat to the belt's pivoting point are in a specific ratio here that can change in relation to the overall adjustment path.

It is possible that the transmitting device consists of an electrical transmitter, e.g., in the form of a potentiometer and a pilot motor.

In another configuration example of the invention, the transmitting device, on the one hand, exhibits a transmitter in the form of a, e.g., hydraulic cylinder in the direction of transmission, which acts upon a receiving cylinder that is connected with the anchoring or deflection

point. However, pneumatic devices. e.g., using negative pressure /6
positioning elements, can be used too.

Moreover, it may be advantageous to configure the transmitting device as a flexible train which transmits both tractive and pressure forces.

The transmitting devices do not need to be configured so that they are capable of, e.g., absorbing the intense forces which become active in the event of an impingement. Rather, the adjustment device can be configured in such a way that an adjustment during the normal operation is easily possible with a greater load on the belt, but with an automatic lock of the deflection and anchoring point, e.g., by means of a catch-stop device.

In another preferred configuration example in accordance with the invention, a two-arm lever is carried on the longitudinally displaceable part of the seat, the one lever arm of which exhibits a pertinent seat height adjustment, and, the other lever arm of which takes up the one end of the transmitting device. If the seat, e.g., is lowered in this process, the height of the anchoring or deflection point is lowered as well.

So that individuals can be captured, previously mentioned "seat giants" may also be "seat dwarfs", whereas a selection process may be provided in which, based on a central position, a change in the height adjustment of the anchoring or deflection point can be realized without a simultaneous adjustment of the seat.

The subject of the invention will be explained in greater detail /7 below by means of a configuration example that is show in the attached drawing. The following is shown in the drawing:

Figure 1 an overall arrangement of the device in accordance with the invention in a privately owned motor vehicle;

Figure 2 a transmitter of the transmission facility working with a simultaneous detection of an adjustment in seat height; and

Figure 3 a transmitter (Bowden cable) of the transmitting device with the option of selecting the translation ratio between the height adjustment and the seat adjustment

A seat belt arrangement is assigned to seat guide rails (1, 2) in the seat belt system in a manner that is not shown, whereas the deflection point (4) of the shoulder belt is provided in the area of the central column (5). A transmitting device (6) is interposed between the seat (3) and the deflection point (4) which is linked to the seat's guide rail (2) on the side of the seat, which is mounted on the seat (3) and which exhibits a hydraulic cylinder (8) as a transmitter (7), which is connected to a receiving cylinder (10) via a line (9). It contains the deflection point (4).

If the seat (3) that is shown in drawn-out lines is displaced in such a way that the coupling point of the transmitting device (6) moves from the position (B) to the position (A) or (C), the coupling point (4) that, e.g., is spring-loaded, shifts in the assigned positions /8 relative to the piston transmission ratio of both cylinders. In this process, the transmission rate is selected so that as large a group of

people as possible is captured by the ergonomic displacement of the coupling point (4), depending upon the position of the seat (3).

The transmitter side of the transmitting device (6) that is shown in sections in Fig. 2 which exhibits a Bowden cable (11) as a means of transmission that transmits both tractive and pressure forces is equipped with a bearing block (12) that is fastened to the seat's guide rail (2) which takes up a pivoting two-armed lever (13). One lever arm (14) of it takes up an adjusting rod (15) which, e.g., engages in a guide (16) in the lower frame (17) of the seat (3) and which responds even when, after the desired longitudinal displacement has been realized by means that are not shown, a height adjustment or lifting of the seat (3), e.g., occurs in the direction of the arrow ("X"). Because the other lever arm (18) of the lever (13) is coupled to the Bowden cable (11), the deflection point is also displaced upwards in the direction of the arrow ("X") in the shifting movement.

In order to be able to also use the transmitting device (6) for the group of people that consists of so-called "seat giants" and "seat dwarfs", a selector unit (19) is interposed in the train of the Bowden cable (11) by means of which an adapted change of the height position of the deflection point is possible without changing the seat position.

The representation in accordance with Fig. 3 depicts a simplified top view of a seat, the displacement movements of which are transmitted in the longitudinal direction of the vehicle via the Bowden cable /9 (11). In a pivot point (20) that is fixed in the vehicle, an adjusting rod (21) is carried, so that it can pivot, whereas the pivoting movement,

e.g., occurs in the form of a crank mechanism through a driving feature (22) that is not shown in any great detail. The contact point exhibits a constant lever length ("b") while the lever length ("a") is changeable to realize a varying ratio between the longitudinal seat adjustment and the height adjustment of the fastening point or deflection point.

Fig. 2

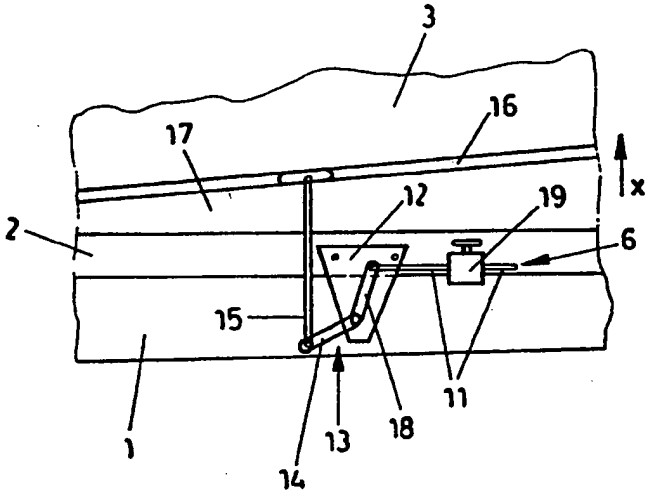
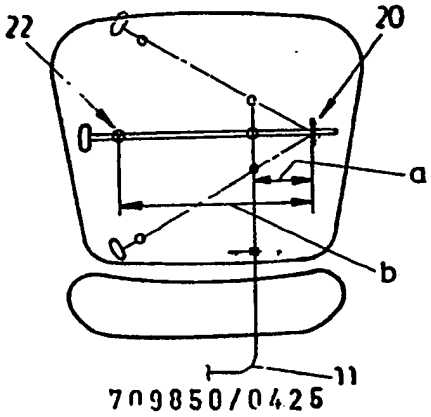


Fig. 3



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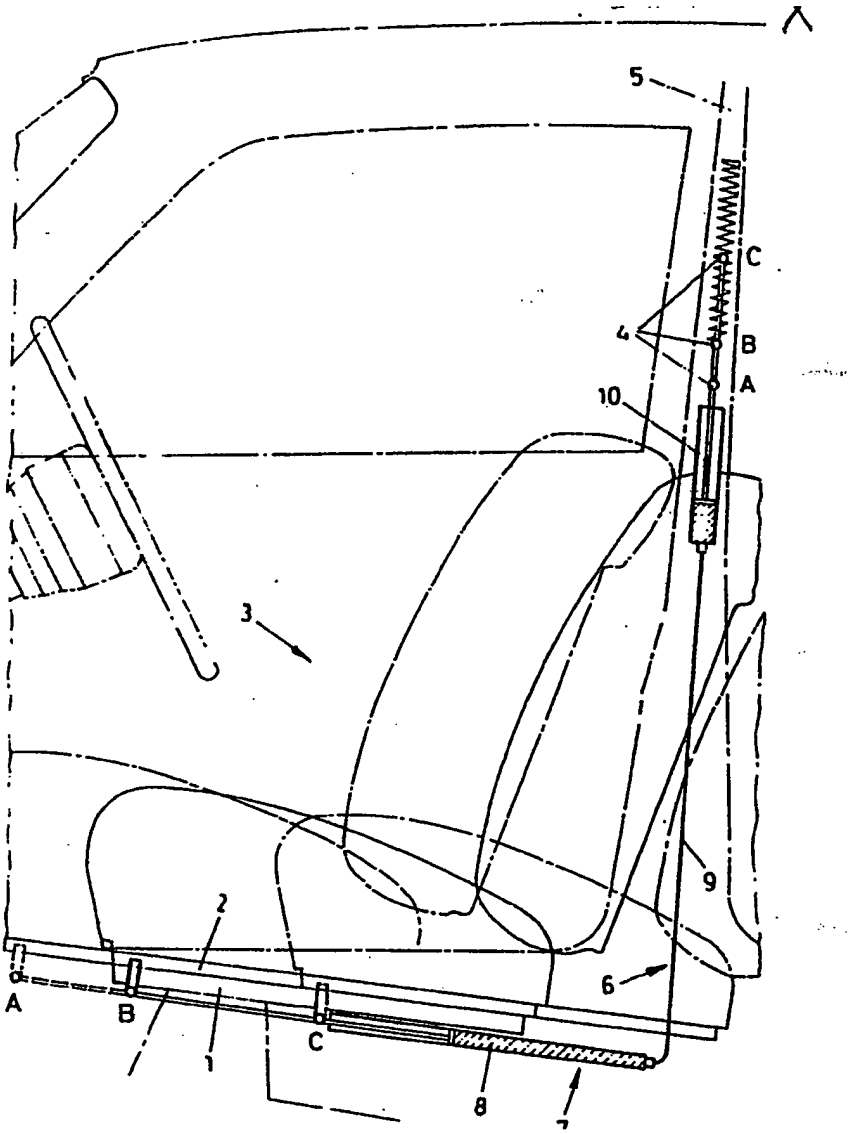
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